

**WHAT IS CLAIMED IS:**

1. A method comprising:  
determining an operational link error rate of a link; and  
estimating a real-time physical link error rate of said link using said operational link error rate.
2. The method of claim 1,  
wherein said link comprises a link between a first network element and a second network element of a communications network;  
wherein said method further comprises,  
detecting an operational link error on said link; and  
wherein said determining comprises,  
determining said operational link error rate of said link in response to said detecting.
3. The method of claim 2, further comprising:  
transferring data on said link between said first network element and said second network element, wherein,  
said detecting, said determining, and said estimating are performed at least partially concurrently with said transferring.
4. The method of claim 3, wherein said detecting comprises,  
performing a cyclic redundancy check on at least a portion of said data.
5. The method of claim 4, wherein,  
said transferring data on said link between said first network element and said second network element comprises,  
transferring a data frame and a frame check sequence, and  
said performing a cyclic redundancy check comprises,  
performing an operation on said data frame to generate a result, and  
comparing said result to said frame check sequence.
6. The method of claim 3, wherein said estimating comprises:  
estimating a real-time bit error rate of said link.

7. The method of claim 3, wherein,  
said transferring data on said link between said first network element and said second network element comprises,  
transferring a plurality of data sets;  
said detecting said operational link error on said link between said first network element and said second network element comprises,  
detecting an operational link error within at least one of said plurality of data sets; and  
said estimating said real-time physical link error rate of said link comprises,  
indicating a physical link error for said at least one of said plurality of data sets.
8. The method of claim 3, further comprising:  
identifying a physical link error alarm set threshold;  
comparing said physical link error alarm set threshold and said real-time physical link error rate; and  
generating an alarm signal in response to said comparing.
9. The method of claim 8, wherein said identifying comprises:  
receiving data specifying a user-specified physical link error alarm set threshold; and  
modifying said user-specified physical link error alarm set threshold using a  
hysteresis factor equal to a ratio of a user-specified physical link error alarm clear threshold and said user-specified physical link error alarm set threshold.
10. The method of claim 3, further comprising:  
identifying a physical link error alarm clear threshold;  
comparing said physical link error alarm clear threshold and said real-time physical link error rate; and  
clearing an alarm signal in response to said comparing.
11. The method of claim 3, further comprising:  
identifying a data rate of said link between a first network element and a second network element;  
comparing said data rate to a predetermined data rate threshold; and  
performing said detecting, said determining, and said estimating in response to said comparison.

12. A machine-readable medium having a plurality of instructions executable by a machine embodied therein, wherein said plurality of instructions when executed cause said machine to perform a method comprising:
  - determining an operational link error rate of a link; and
  - estimating a real-time physical link error rate of said link using said operational link error rate.
13. The machine-readable medium of claim 12,
  - wherein said link comprises a link between a first network element and a second network element of a communications network;
  - wherein said method further comprises,
    - detecting an operational link error on said link; and
  - wherein said determining comprises,
    - determining said operational link error rate of said link in response to said detecting.
14. The machine-readable medium of claim 13, said method further comprising:
  - transferring data on said link between said first network element and said second network element, wherein,
    - said detecting, said determining, and said estimating are performed at least partially concurrently with said transferring.
15. The machine-readable medium of claim 14, wherein said detecting comprises,
  - performing a cyclic redundancy check on at least a portion of said data.
16. The machine-readable medium of claim 15, wherein,
  - said transferring data on said link between said first network element and said second network element comprises,
    - transferring a data frame and a frame check sequence, and
  - said performing a cyclic redundancy check comprises,
    - performing an operation on said data frame to generate a result, and
    - comparing said result to said frame check sequence.
17. The machine-readable medium of claim 14, wherein said estimating comprises:
  - estimating a real-time bit error rate of said link.

18. The machine-readable medium of claim 14, wherein,  
said transferring data on said link between said first network element and said second network element comprises,  
transferring a plurality of data sets;  
said detecting said operational link error on said link between said first network element and said second network element comprises,  
detecting an operational link error within at least one of said plurality of data sets; and  
said estimating said real-time physical link error rate of said link comprises,  
indicating a physical link error for said at least one of said plurality of data sets.
19. The machine-readable medium of claim 14, said method further comprising:  
identifying a physical link error alarm set threshold;  
comparing said physical link error alarm set threshold and said real-time physical link error rate; and  
generating an alarm signal in response to said comparing.
20. The machine-readable medium of claim 19, wherein said identifying comprises:  
receiving data specifying a user-specified physical link error alarm set threshold; and  
modifying said user-specified physical link error alarm set threshold using a hysteresis factor equal to a ratio of a user-specified physical link error alarm clear threshold and said user-specified physical link error alarm set threshold.
21. The machine-readable medium of claim 14, said method further comprising:  
identifying a physical link error alarm clear threshold;  
comparing said physical link error alarm clear threshold and said real-time physical link error rate; and  
clearing an alarm signal in response to said comparing.

22. The machine-readable medium of claim 14, said method further comprising:  
identifying a data rate of said link between a first network element and a second network element;  
comparing said data rate to a predetermined data rate threshold; and  
performing said detecting, said determining, and said estimating in response to said comparison.
23. An apparatus comprising:  
a monitoring subsystem to determine an operational link error rate of a link and to estimate a real-time physical link error rate of said link using said operational link error rate; and  
an alarm subsystem to generate an alarm signal in response to a comparison of said real-time physical link error rate and a physical link error alarm set threshold.
24. The apparatus of claim 23, further comprising:  
a configuration subsystem to receive data specifying said physical link error alarm set threshold.
25. The apparatus of claim 23, wherein said monitoring subsystem comprises:  
a monitoring subsystem to detect an operational link error on said link.
26. The apparatus of claim 25, wherein  
said link comprises a link between a first network element and a second network element of a communications network; and  
said monitoring subsystem comprises  
a monitoring subsystem to determine said operational link error rate of said link and to estimate said real-time physical link error rate of said link using said operational link error rate at least partially concurrently with a transfer of data between said first network element and said second network element on said link.

27. The apparatus of claim 26, wherein said monitoring subsystem to detect said operational link error on said link comprises:
  - a monitoring subsystem to perform a cyclic redundancy check on at least a portion of said data.
28. The apparatus of claim 26, wherein said cyclic redundancy check comprises a frame check sequence check.
29. The apparatus of claim 23, wherein said alarm subsystem comprises:
  - an alarm subsystem to clear said alarm signal in response to a comparison of said real-time physical link error rate and a physical link error alarm clear threshold.
30. An apparatus comprising:
  - means for determining an operational link error rate of a link; and
  - means for estimating a real-time physical link error rate of said link using said operational link error rate.
31. The apparatus of claim 30,
  - wherein said link comprises a link between a first network element and a second network element of a communications network; and
  - said apparatus further comprises,
    - means for detecting an operational link error on said link coupled with said
    - means for determining said operational link error rate of said link.